

2016



Missouri Deer Season Summary & Population Status Report



Missouri Department of Conservation

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Resource Science Division

Our Mission and Vision

The mission of the Missouri Department of Conservation (MDC) is to protect and manage the fish, forest, and wildlife resources of the state, and to facilitate and provide opportunity for all citizens to use, enjoy, and learn about these resources.

The protection and management of Missouri's valuable wildlife is made possible thanks to staff, private landowners, and all other Missourians supporting the one-eighth of one percent Conservation Sales Tax, permit sales, and income generated by fish and wildlife tourism.

Thank you!



A primary goal of MDC's Cervid (Deer & Elk) Program is to maintain balanced deer populations at desired levels while providing deer-related recreational opportunities for Missourians. We define "desired levels" as the point at which deer populations are both biologically sustainable and socially acceptable to hunters, landowners, and other interested stakeholders. The Cervid Program, managed by the Resource Science Division, develops annual regulation recommendations based on harvest data, hunter and landowner surveys, MDC staff surveys, public comments, population simulations, and the Chronic Wasting Disease (CWD) management plan.

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Equal Opportunity to Participate

Equal opportunity to participate in and benefit from programs of the Missouri Department of Conservation is available to all individuals without regard to their race, color, nationality, sex, age, or disability. Questions should be directed to the Department of Conservation, PO Box 180, Jefferson City, MO 65102, 573-751-4115 (voice) or 800-735-2966 (TTY), or to the U.S. Fish and Wildlife Service Division of Federal Assistance, 4401 N. Fairfax Drive, Mail Stop: MBSP-4020, Arlington, VA 22203.

2016 Overview

| Season | Dates | What Was New for 2016? | |
|-------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Archery Deer and Turkey | Sept. 15-Nov. 11, 2016 Nov. 23, 2016-Jan. 15, 2017 | <ul style="list-style-type: none"> The urban zone portion of firearms deer season was eliminated. Crossbows were legalized as an archery method and could be used during the archery deer and turkey season. | <ul style="list-style-type: none"> Hunters could fill two firearms antlerless permits in Carroll, Crawford, Franklin, Gasconade, Jefferson, Livingston, Warren and Washington counties. |
| Firearms Deer Early Youth Portion | Oct. 29-30, 2016 | <ul style="list-style-type: none"> Hunters could take only two antlered deer during the archery and firearms deer seasons combined. Only one antlered deer could be taken prior to the November portion of firearms season. | <ul style="list-style-type: none"> Qualifying landowners in Crawford and Washington counties could receive two no-cost firearms antlerless permits. |
| Firearms Deer November Portion | Nov. 12-22, 2016 | | <ul style="list-style-type: none"> Crawford, Franklin, Jefferson and Warren counties were open during the antlerless portion of firearms season. |
| Firearms Deer Late Youth Portion | Nov. 25-27, 2016 | <ul style="list-style-type: none"> Hunters who harvested deer during opening weekend within the Chronic Wasting Disease (CWD) Management Zone were required to take it to a sampling station to be tested for CWD. | <ul style="list-style-type: none"> New managed deer hunts were added and others were modified or removed. |
| Firearms Deer Antlerless Portion | Dec. 2-4, 2016 | <ul style="list-style-type: none"> New counties were added to the CWD Management Zone. | <ul style="list-style-type: none"> Deer hunting regulations changed for most conservation areas. |
| Firearms Deer Alternative Methods Portion | Dec. 24, 2016-Jan. 3, 2017 | <ul style="list-style-type: none"> Hunters were asked new questions when Telechecking a deer. | <ul style="list-style-type: none"> The antler-point restriction was lifted in Carroll, Franklin, Gasconade, Jefferson, Warren and Washington counties. |

Season Summary

Overall, the statewide deer harvest for 2016 was very similar to the 2015 season, with a 3% decrease in the total number of deer harvested (Table 1), a 1% decrease in the total number of hunters (Table 5), and a 2% increase in permits issued (Table 4). During the 2016 season, antlered-buck harvest continued to outpace doe harvest (Fig. 1). Hunters harvested 16% more antlered bucks than does, compared to last year's 2% difference. Greater differences in 2016 were due to a shorter firearms antlerless portion, designed to reduce statewide doe harvest to help stabilize or slightly increase deer populations. Additionally, increased antlered buck harvest was partially due to the antler-point restriction (APR) being lifted in 6 additional counties in 2016, which meant that more bucks were legal to harvest in those counties.

Deer Management

Deer populations across much of Missouri are currently at, or slightly below, desired levels (Fig. 16). Therefore, statewide deer management goals are largely focused on stabilizing or slightly increasing deer numbers, while balancing these efforts with ongoing Chronic Wasting Disease (CWD) management. To achieve these goals, firearms antlerless permits have been limited and the Antlerless Portion of firearms season has been reduced to 3 days. Within the CWD Management Zone, firearms antlerless permits have been liberalized and the APR lifted to prevent unwanted population increases where the disease is likely to exist and limit the number of young bucks that may disperse and carry the disease to new areas.

For more information regarding CWD, see pages 26-27.

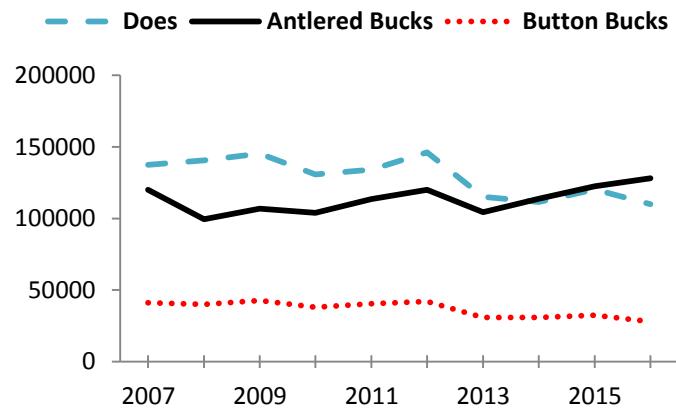


Figure 1. The number of does, antlered bucks, and button bucks harvested statewide from 2007 to 2016.

| 2016 Harvest Overview | | | | |
|-----------------------|---------------|----------------------|---------------------------|----------------------------|
| Region | Total Harvest | Difference from 2015 | Difference from 5-yr Avg. | Difference from 10-yr Avg. |
| Central | 40,517 | -3% | -3% | -7% |
| Kansas City | 25,611 | -2% | -2% | -9 |
| Northeast | 38,235 | 1% | -4% | -14% |
| Northwest | 27,502 | -3% | -11% | -24% |
| Ozark | 39,758 | -8% | 1% | 6% |
| Southeast | 30,761 | 4% | -1% | 10% |
| Southwest | 39,371 | -5% | 1% | 6% |
| St. Louis | 24,389 | -6% | -2% | 0% |
| Statewide | 266,144 | -3% | -2% | -6% |

Table 1. The total harvest by region compared to 2015, the 5-year average and the 10-year average

2016 Deer Season Summaries

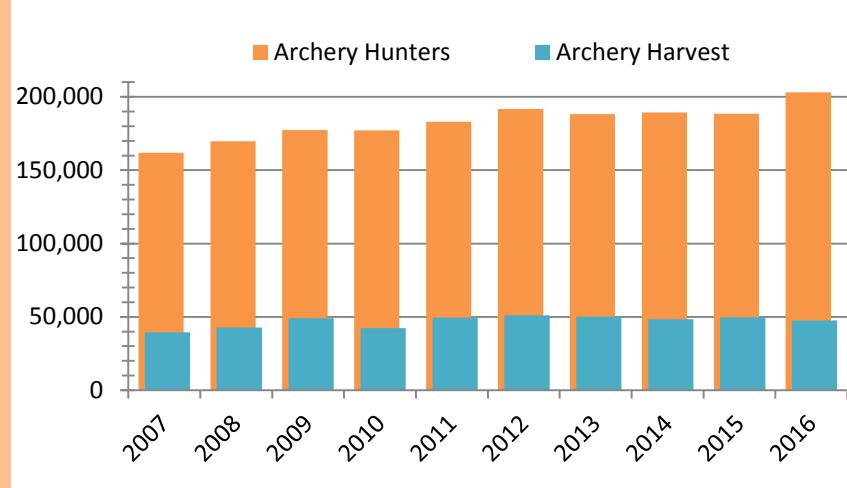


Figure 2. Trends in the number of individuals holding an archery permit and deer harvested on those permits.

Photo at right: A youth hunter successfully harvested a doe using a compound bow while 30% of other successful archery hunters opted for a crossbow this year.



Archery Season Summary

Archery hunter participation increased during the 2016 season with an 8% increase in the number of archery hunters and an 11% increase in the number of archery permits purchased compared to 2015. These increases are likely a result of the new regulation that allowed crossbows to be used during archery season. Youth archery permits alone increased by 27%, with 15% more archery hunters under the age of 16.

Despite an increase in archery hunters, archery harvest in 2016 was similar to previous years. Archers harvested 4% fewer deer this year compared to 2015, with the greatest decrease attributed to the number of button bucks and does harvested. Archery hunters accounted for 18% of the total 2016 season harvest.

For more information about crossbows and the impact they had on the 2016 deer season, see page 22.

Managed Deer Hunt Summary

Managed deer hunts are an important tool used by land managers and cooperators to regulate deer populations on public land and to provide unique hunting opportunities. Missouri offers over 100 managed deer hunts from mid-September through mid-January, including hunts exclusively for youth and those with disabilities.

Managed deer hunt participants harvested 1,393 deer during the 2016 season; a 5% reduction from last year. Three more managed hunts were added for a total of 96 opportunities. This total does not include the 17 hunts exclusively for hunters with disabilities. Whetstone Creek Conservation Area had the highest firearm hunter success rate, with 60% of the 25 hunters harvesting at least 1 deer for a total of 19 deer harvested.

For more details regarding the 2016 managed hunt results, contact your regional MDC office (pg. 9) or visit mdc.mo.gov.



| 2016 Managed Hunt Statistics* | |
|-------------------------------|--------|
| Managed Hunts | 96 |
| Applicants | 22,180 |
| Hunters Selected | 4,821 |
| Deer Harvested | 1,200 |
| Success Rate | 20% |

Table 2. Hunters who applied for a managed hunt had a 22% chance of being drawn and a 20% chance of successfully harvesting a deer.

*Does not include disabled or youth managed hunts.

2016 Deer Season Summaries



The late youth portion continues to show an increase in participation and harvest success.

Firearms Season Summary

Harvest during the 2016 firearms season, which includes both youth portions, the November portion, the antlerless portion, and the alternative methods portion, totaled 217,200 deer (Table 3). This was a 3% decrease from last year with firearm permit sales remaining steady (Table 4).

Beginning in 2016, the late youth portion was moved to the first weekend after Thanksgiving and was extended by one day in an effort to continue the increase in participation and harvest by young hunters. This change had positive results, with a 76% increase in antlered bucks harvested and a 27% increase in total deer harvested compared to 2015 (Table 3).

In addition, the antlerless portion was changed in order to reduce statewide antlerless deer harvest, with a goal to stabilize or slightly increase the deer population. The portion was reduced from 12 days beginning the day after the November portion concluded, to 3 days beginning the second Friday after the November portion concluded. With fewer days, the total antlerless portion harvest decreased 32% from last year, but still made up 2% of the total harvest (Fig. 4).

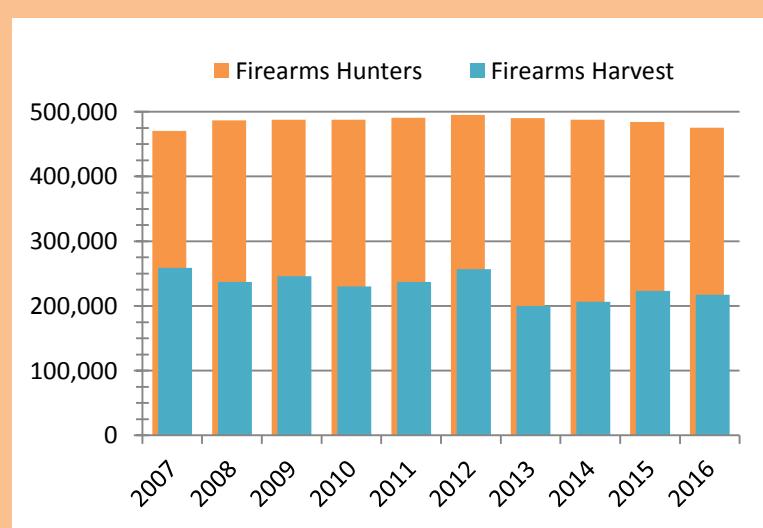


Figure 3. Trends in the number of individuals in Missouri holding a firearms permit and deer harvested on those permits, 2007-2016.

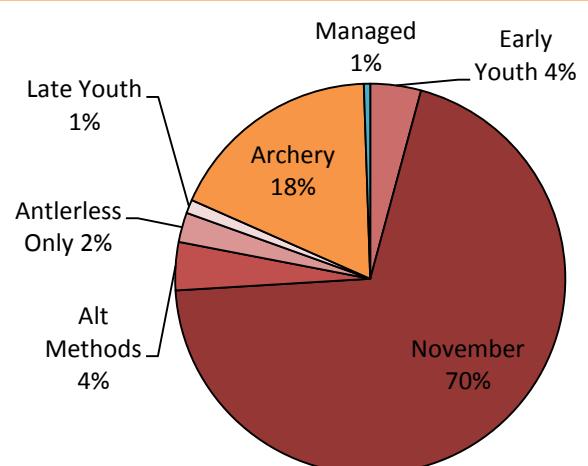


Figure 4. Composition of total deer harvest in Missouri by season and portion of the firearms season, 2016.

Table 3. Deer Season Harvest Comparison: 2015 & 2016

| Season/Portion | Antlered Deer | | | Button Bucks | | | Does | | | Total | | |
|--------------------------|---------------|---------|------|--------------|--------|------|---------|---------|-------|---------|---------|------|
| | 2015 | 2016 | Diff | 2015 | 2016 | Diff | 2015 | 2016 | Diff. | 2015 | 2016 | Diff |
| Archery | 20,169 | 20,771 | 3% | 5,419 | 4,694 | -13% | 24,171 | 22,086 | -9% | 49,759 | 47,551 | -4% |
| Urban | 1 | N/A | --- | 66 | N/A | --- | 325 | N/A | --- | 392 | N/A | --- |
| Managed Hunts | 424 | 385 | -9% | 224 | 222 | -1% | 820 | 786 | -4% | 1,468 | 1,393 | -5% |
| Early Youth | 8,042 | 7,258 | -10% | 1,514 | 1,007 | -33% | 4,027 | 2,914 | -28% | 13,583 | 11,179 | -18% |
| Late Youth | 664 | 1,168 | 76% | 376 | 433 | 15% | 1,313 | 1,389 | 6% | 2,353 | 2,990 | 27% |
| November | 90,094 | 95,717 | 6% | 20,911 | 18,977 | -9% | 75,537 | 71,787 | -6% | 186,542 | 185,881 | 0% |
| Alt methods | 2,914 | 2,792 | -4% | 1,555 | 197 | -4% | 6,339 | 6,326 | 0% | 10,808 | 10,615 | -2% |
| Antlerless Only | 146 | 28 | -81% | 1,723 | 1,131 | -34% | 7,673 | 5,376 | -30% | 9,542 | 6,535 | -32% |
| CWD¹ | 70 | 54 | -23% | 14 | 11 | -21% | 35 | 35 | 0% | 119 | 100 | -16% |
| Total² | 122,524 | 128,173 | 5% | 31,802 | 27,972 | -12% | 120,240 | 110,099 | -8% | 274,566 | 266,244 | -3% |

¹CWD Management Seals are part of the MDC's management plan to limit the spread of CWD. These seals were distributed to landowners who own 5 acres or more in the CWD Core Areas (see page 27), which permit the harvest of one deer of either sex on the specific property for which it was issued.

²These totals contain the CWD Management Seals and will not reflect the same numbers as Table 1 or Table 5.

Table 4. Permit Issued and Harvest by Permit Type

| Permit Type | Number of Permits | | | Number of Deer Harvested ¹ | | |
|--------------------------------------|-------------------|---------|------|---------------------------------------|---------|------|
| | 2015 | 2016 | Diff | 2015 | 2016 | Diff |
| Permittee Archery Any-Deer | 109,498 | 115,475 | 5% | 23,376 | 24,018 | 3% |
| Landowner Archery Any-Deer | 85,327 | 94,339 | 11% | 6,660 | 6,188 | -7% |
| Youth Archery Any-Deer | 6,148 | 7,455 | 21% | 877 | 1,049 | 20% |
| Permittee Archery Antlerless | 48,641 | 51,784 | 6% | 13,494 | 11,533 | -15% |
| Landowner Archery Antlerless | 142,400 | 165,114 | 16% | 5,383 | 5,287 | -2% |
| Youth Archery Antlerless | 1,821 | 2,700 | 48% | 379 | 303 | -20% |
| Permittee Firearms Any-Deer | 294,465 | 289,281 | -2% | 81,237 | 80,628 | -1% |
| Landowner Firearms Any-Deer | 178,201 | 178,004 | 0% | 40,463 | 38,587 | -5% |
| Youth Firearms Any-Deer | 54,282 | 54,079 | 0% | 18,703 | 17,474 | -7% |
| Permittee Firearms Antlerless | 186,830 | 179,747 | -4% | 55,511 | 51,821 | -7% |
| Landowner Firearms Antlerless | 154,835 | 154,579 | 0% | 25,937 | 21,857 | -16% |
| Youth Firearms Antlerless | 21,336 | 21,520 | 1% | 6,394 | 5,734 | -10% |
| Resident Firearms | 860,581 | 846,324 | -2% | 216,610 | 203,643 | -6% |
| Nonresident Firearms | 29,368 | 30,886 | 5% | 11,635 | 12,458 | 7% |
| Resident Archery | 381,917 | 423,738 | 11% | 46,367 | 44,306 | -4% |
| Nonresident Archery | 11,918 | 13,129 | 10% | 3,802 | 4,072 | 7% |

¹The total number of deer reported in this table does not include deer Telechecked under unknown permit types and will not reflect the same numbers as Table 5.

Table 5. Deer Hunter and Harvest Facts

| | Archery | Firearms | Archery & Firearms Combined |
|------------------------------------|---------------------------|----------------|---------------------------------------|
| Age Distribution of Hunters | Number of Hunters | | Total Hunters¹ |
| 10 or younger | 2,604 | 22,385 | 22,647 |
| 11-15 | 10,969 | 45,509 | 46,647 |
| 16-40 | 85,967 | 175,141 | 189,814 |
| 41 or older | 103,558 | 232,376 | 242,468 |
| Total Hunters | 203,098 | 475,411 | 501,576 |
| Any-Deer Permits Issued | Number of Hunters | | Number of Hunters¹ |
| Resident | 112,280 | 322,395 | 341,225 |
| Nonresident | 10,650 | 20,965 | 28,586 |
| Landowner | 94,339 | 178,004 | 180,634 |
| Antlerless Permits Issued | Number of Hunters | | Total Hunters |
| 1 | 41,489 | 174,603 | 216,092 |
| 2 | 5,228 | 12,181 | 17,409 |
| 3 | 491 | 483 | 974 |
| 4 or more | 236 | 185 | 421 |
| Deer Harvested | Number of Hunters | | Number of Hunters² |
| 0 | 165,199 | 295,187 | 300,675 |
| 1 | 30,203 | 147,704 | 152,152 |
| 2 | 5,848 | 28,798 | 37,721 |
| 3 | 1,283 | 3,371 | 8,091 |
| 4 or more | 565 | 351 | 2,937 |
| Antlered Deer Harvested | Number of Hunters | | Number of Hunters² |
| 0 | 182,485 | 369,242 | 380,483 |
| 1 | 20,079 | 105,498 | 114,319 |
| 2 | 475 | 653 | 6,656 |
| Deer Harvested | Percent of Hunters | | Percent of Hunters² |
| 0 | 81% | 62% | 60% |
| 1 | 15% | 31% | 30% |
| 2 | 3% | 6% | 8% |
| 3 or more | 0.9% | 0.8% | 2% |
| Antlered Deer Harvested | Percent of Hunters | | Percent of Hunters² |
| 0 | 90% | 78% | 75% |
| 1 | 10% | 22% | 25% |
| 2 | 0.2% | 0.1% | 0.2% |

¹Number of individuals that held an archery and/or firearms any-deer permit²Number/percent of individuals that harvested the specified number of deer when combining their archery and firearms harvest

Regional Deer Populations

Statewide deer population trends are important; however, regional deer population trends are more informative to most landowners and hunters. This smaller scale makes deer population trends apparent and the factors influencing populations more easily identified. Although regional information is more indicative of population trends, it is important to acknowledge that deer populations can vary considerably within a region, and even within a county. Regional and local diversity in deer numbers is a result of differences in land cover and use, harvest regulations, hunter goals and density, and disease events, to name a few. Therefore, regional information should be considered as a starting point when evaluating deer populations within a localized area.



Regional Offices

Central Region

3500 East Gans Road
Columbia, MO 65201
573-815-7900

Kansas City Region

12405 SE Ranson Road
Lee's Summit, MO 64082
816-622-0900

Northwest Region

701 James McCarthy Dr.
St. Joseph, MO 64507
816-271-3100

Ozark Region

551 Joe Jones Blvd.
West Plains, MO 65775
417-256-7161

Southeast Region

2302 County Park Drive
Cape Girardeau, MO 63701
573-290-5730

Northeast Region

3500 S. Baltimore
Kirksville, MO 63501
660-785-2420

Southwest Region

2630 N. Mayfair
Springfield, MO 65803
417-895-6880

St. Louis Region

2360 Highway D
St. Charles, MO 63304
636-441-4554

Regional Deer Summaries

Central Region

In 2016, the Central Region had the highest regional deer harvest with a total of 40,517 deer (Table 6) which was 3% lower than the total for 2015. The deer population in the Central Region is still slowly recovering from a low point in 2013 following a particularly extreme outbreak of hemorrhagic disease in 2012. Overall, the population is well below the biological carrying capacity for the Central Region, and according to recent survey results, deer populations remain at, or slightly below, the socially acceptable level (Fig. 16). The top five harvest counties for 2016 were the same as in 2015 and include Callaway, Morgan, Osage, Camden and Gasconade (Table 6). Callaway County is still the top-harvesting county despite a 5% decrease from 2015. Most of the Central Region is within a CWD Management Zone due to the CWD positive deer detected in Cole County in 2014.

See page 26-27 for more about CWD.

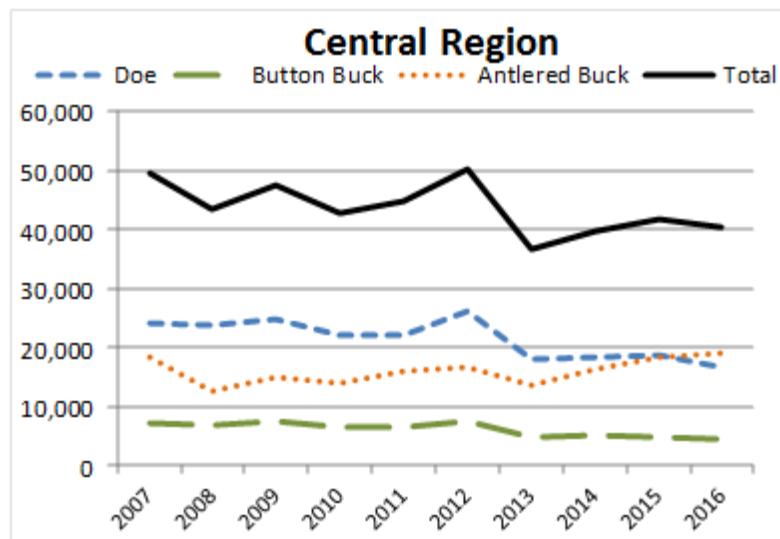


Figure 5. Total harvest breakdown for the Central Region from 2007-2016.

Kansas City Region

Total harvest for the Kansas City Region was 2% lower in 2016 than in 2015. Over the past 10 years, the region's deer population has been fairly stable, with a slight decrease in 2013 following a severe outbreak of hemorrhagic disease in 2012. Recently, the deer population in the Kansas City Region has been stable to slightly decreasing (Fig. 17). Counties with the highest harvest in 2016 include Benton, St. Clair, Vernon, Henry and Johnson (Table 6). Benton County had a 2% increase in harvest from 2015; whereas, St. Clair County had nearly a 5% decrease in harvest. In order to help increase the deer population across much of Missouri, antlerless permits have been limited and the antlerless season was shortened to 3 days.

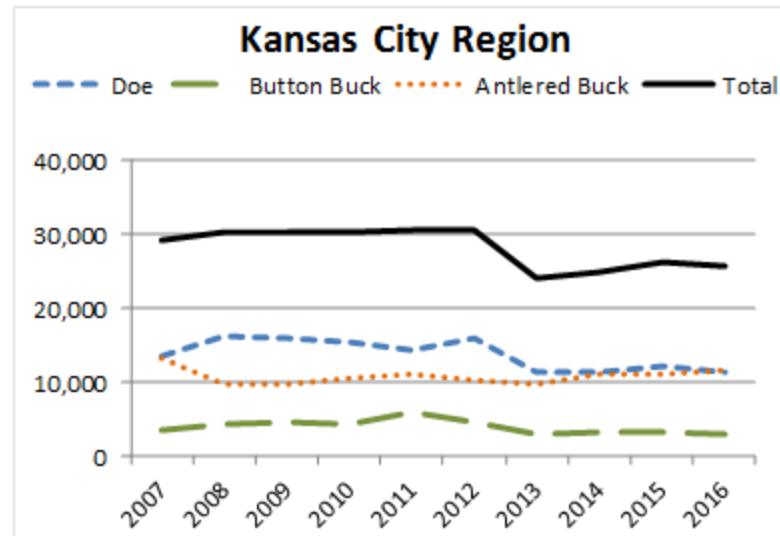


Figure 6. Total harvest breakdown for the Kansas City Region from 2007-2016.



Two antlered bucks harvested in St. Clair County tested positive for CWD bringing the total number of CWD-positive cases in Missouri to 9 for this past season. These are the first 2 cases of CWD for this county and for western Missouri.

See page 26-27 for more about CWD.

Northeast Region

Deer harvest totals in the Northeast Region have remained relatively stable following a substantial decrease in 2013. There was a small, 1% increase in the 2016 harvest from 2015 leaving the region 4% lower than the 5-year average and 14% lower than the 10-year average. The top 5 harvest counties include Macon, Pike, Monroe, Adair, and Scotland, with Macon having a 3% decrease in harvest from 2015 (Table 6). Throughout the Northeast Region, deer populations seem to be remaining stable or slightly decreasing (Fig. 17). Much of this region remains within a CWD Management Zone due to positive detections in Macon and Adair Counties, but fortunately, no new counties have been added for this Region. Antlered buck harvest increased in most counties in this region, which may be due to a population recovering from hemorrhagic disease. The APR likely influenced harvest in the six counties (Clark, Lewis, Pike, Marion, Monroe, and Ralls) with the highest increases in antlered buck harvest.

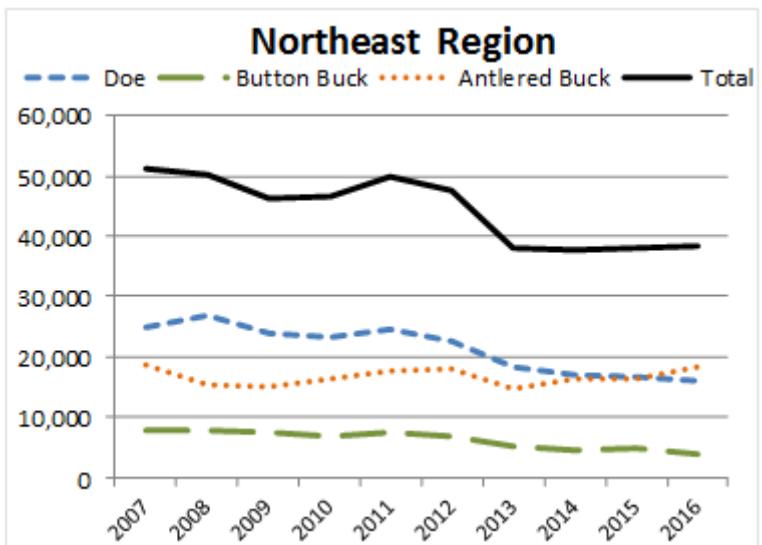


Figure 7. Total harvest breakdown for the Northeast Region from 2007-2016.

Northwest Region

The Northwest Region continues to exhibit the greatest regional declines in population size and harvest over the last 10 years compared to other regions (Fig. 15 & 16). These declines are attributed to severe hemorrhagic outbreaks in 2012 and 2013, as well as historically liberal antlerless harvest and habitat loss through conversion of CRP land to row-crop agriculture. Hemorrhagic disease outbreaks tend to be more severe in Northern Missouri, where outbreaks are less frequent and more deer are naïve to the virus. Total harvest for the Northwest Region was 3% and 6% lower than 2015 and 2014, respectively. While the region as a whole has seen a steady decrease in harvest totals, there are a few counties with harvest increases for 2016. These counties include Holt (+6%), Carroll (+4%), and Clinton (+3%). The top harvesting counties for the Northwest Region are Harrison, Linn, Mercer, Daviess and Carroll (Table 6). There are currently 4 counties in the Northwest Region that are within a CWD Management Zone (see Pg. 26).

The northern regions of Missouri continue to see the effects of a particularly extreme outbreak of hemorrhagic disease in 2012, with harvest and populations below the 5-year average. Regulations such as the shortened antlerless portion and limited antlerless permits are in place to promote an increase in deer populations in counties outside of the CWD Management Zone.

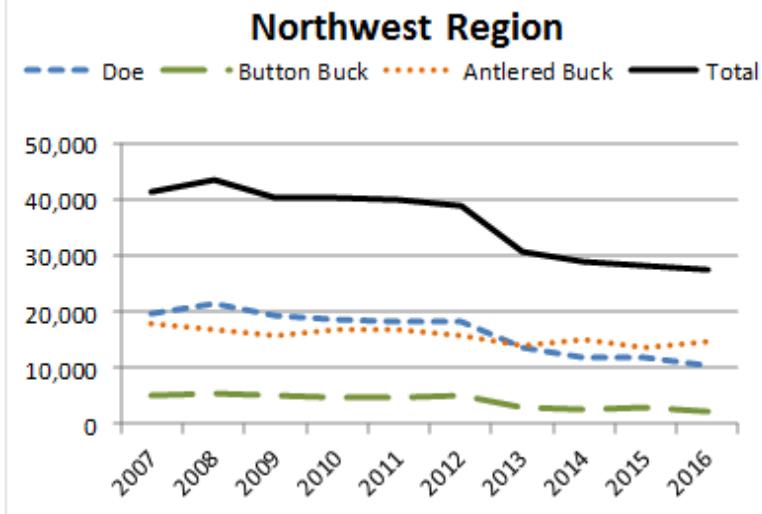


Figure 8. Total harvest breakdown for the Northwest Region from 2007-2016.



Regional Deer Summaries

Ozark Region

In heavily forested regions like the Missouri Ozarks, acorn production can have a substantial impact on annual deer harvest. During years of low acorn production, deer movement is greater as they search for alternate sources of food, therefore increasing the number of deer sightings and deer harvested. Conversely, high acorn production leads to lower deer movement and a decrease in overall harvest. Acorn production during 2016 was above average for much of the Ozark Region and, consequently, harvest was down 8% from the previous year. Nevertheless, the region was still 1% higher than the 5-year average and 6% higher than the 10-year average indicating a slowly increasing deer population. The top-producing counties for the Ozark Region included Howell, Texas, Oregon, Ripley and Ozark (Table 6).

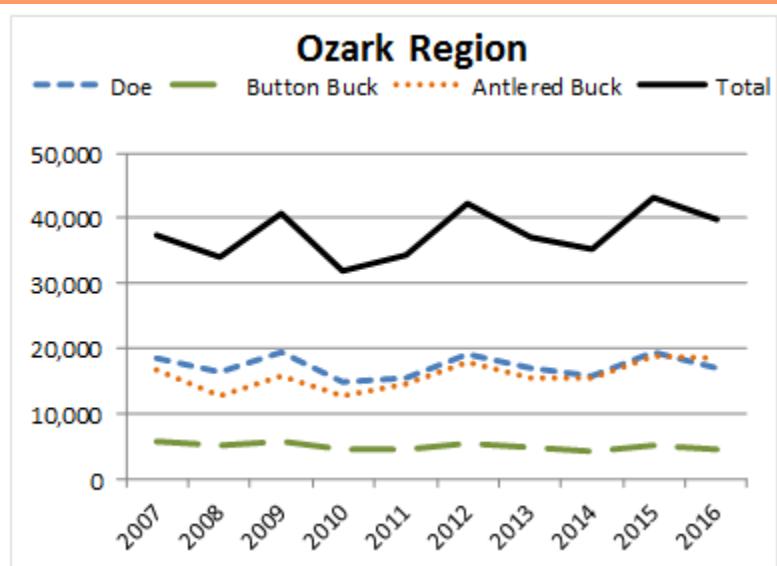


Figure 9. Total harvest breakdown for the Ozark Region from 2007-2016.

Southeast Region

The Southeast has some of the most diverse habitat in the state causing the deer population to vary dramatically throughout the Region. There are heavily forested areas with plenty of cover and food, while the "boot-heel" has a stronger agricultural component. Overall, the deer population in the Southeast Region has been slowly increasing over the past several years. Likewise, the total harvest number has increased by 4% in 2016 compared to 2015, which is a 1% decrease from the 5-year average and a 10% increase from the 10-year average. The top-harvesting counties in the Southeast Region were Wayne, Bollinger, Perry, Cape Girardeau and Ste. Genevieve (Table 6). During Spring 2017, the Southeast Region experienced a significant flood event. Deer are typically resilient to these types of weather events, thus it is not likely that the flooding had a substantial effect on deer numbers. Moreover, the flooding occurred prior to the peak in fawning season. We will continue to monitor the deer population in this area to determine population status and trends.

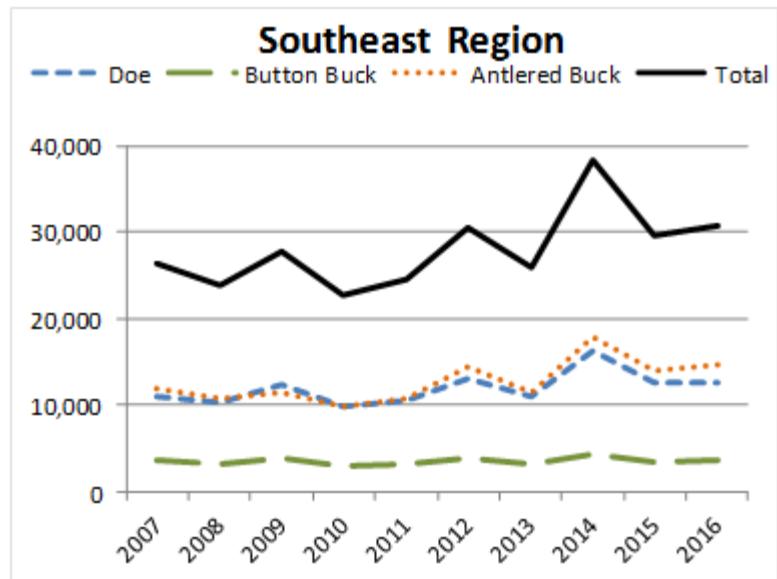


Figure 10. Total harvest breakdown for the Southeast Region from 2007-2016.



Over the past 10 years there has been a slow but steady increase in the deer populations and total number of deer harvested in the Southern regions of Missouri. The management practices and deer research projects in these regions will help MDC closely monitor and regulate the herd to keep deer numbers at desirable levels.

See page 24 for more details about deer research projects.

St. Louis Region

The St. Louis Region exhibited the lowest regional harvest during the 2016 hunting season. A total of 24,389 deer were harvested, which was 6% lower than the 2015 harvest and 2% lower than the 5-year average. Despite decreases, we estimate the deer population is stable to slightly increasing (Fig. 17). The MDC continues to work to address issues associated with large numbers of deer within urban areas that are common within the St. Louis Region. The counties with the highest total harvests included Franklin, Jefferson, Lincoln, Crawford and Washington (Table 6). Almost all of the St. Louis Region is currently within the CWD Management Zone with recent detections of CWD-positive deer within Franklin County. Lincoln County is the only county within the region not included in a CWD Management Zone at this time (see Pg. 26).

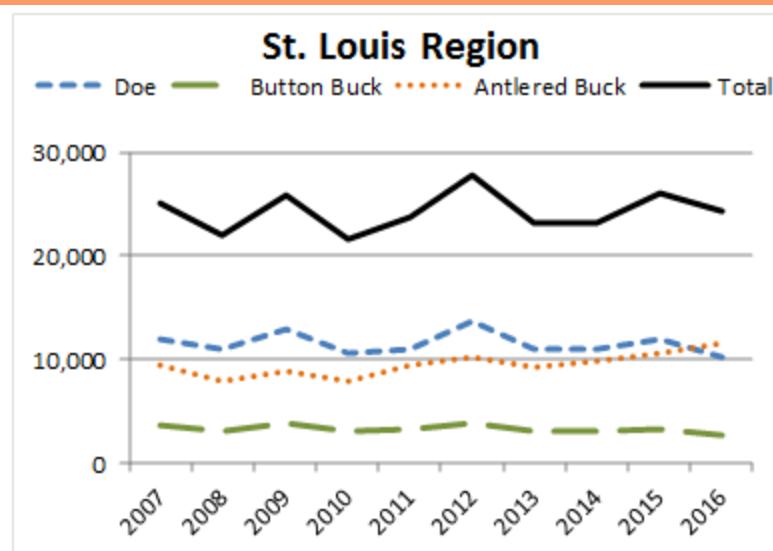


Figure 11. Total harvest breakdown for the St. Louis Region from 2007-2016.

Southwest Region

During the 2016 hunting season, the Southwest Region ranked third in Missouri for total number of deer harvested. This total was 5% lower than the 2015 harvest. Even with the decrease, the Southwest is 1% above the 5-year average and 6% above the 10-year average. The deer population in this area has seen some increases over the past 10 years with current population trends appearing to be stable and at socially acceptable levels (Fig. 16 & 17). Laclede, Dallas, Webster, Polk and Greene Counties (Table 6) ranked as the top 5 counties in the region for total deer harvested, even though Laclede County was significantly lower (-16%) in 2016 than 2015. Parts of this region will now be in the CWD Management Zone due to the detection of CWD in neighboring St. Clair County and northwestern Arkansas.

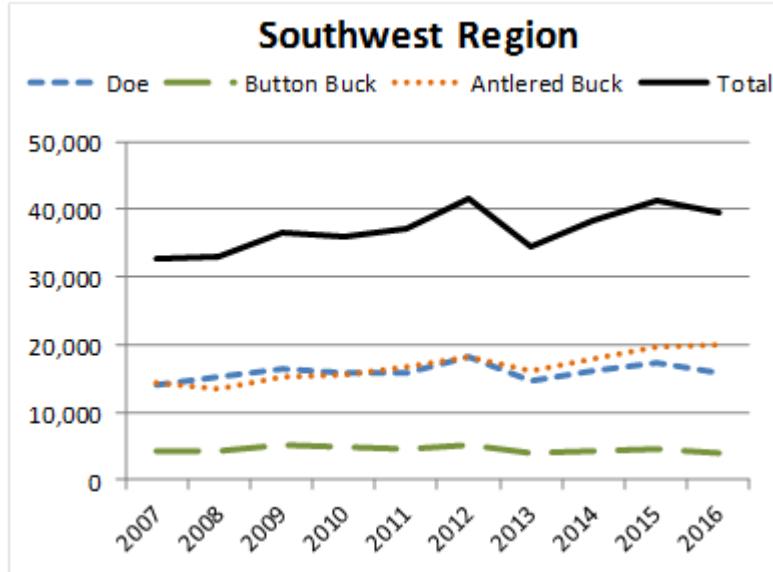


Figure 12. Total harvest breakdown for the Southwest Region from 2007-2016.

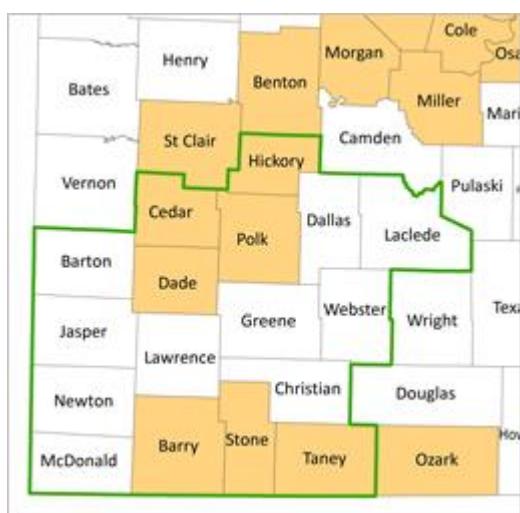


Figure 13. Ten surrounding counties in the Kansas City, Southwest and Ozark Regions have been added to the CWD Management Zone due to the detection of CWD in St. Clair County and a large number of CWD-positive deer/elk in northwestern Arkansas. This map shows the southwest region outlines in green with the CWD Management Zone counties colored yellow, 2017.

See page 26-27 for more information about CWD.

County Deer Population Trends

Deer populations are highly variable within a state, region, and even county due to variation in habitat, harvest regulations, local hunter goals and practices, hunter density, amount of public and private land, and disease outbreaks (e.g., hemorrhagic disease). Therefore, county-wide assessments of deer population trends are not applicable to every local situation, but are a general representation of the current status and population trend for each respective county.

The Cervid Program evaluates a variety of data to assess county-specific deer populations and for regulation development including:

- **Harvest data**—The total number and composition (antlered bucks, does, and button bucks) of harvested deer.
- **Population data**—Population simulations incorporating harvest, age-at-harvest data, and estimated survival/reproduction rates.
- **Hunter, landowner, and staff surveys**—Hunters and landowners are randomly selected to receive mail surveys.
- **Public & staff input**—Input is received via email, the MDC website, public meetings, and phone calls.



Social data is critical when assessing the deer population in relation to public acceptance levels. In cooperation with the USDA, we send out surveys statewide to 9,000 agricultural producers to assess perceptions and attitudes toward deer populations and regulations. Additionally, we survey 35,000 archery hunters and 50,000 firearm hunters in order to estimate hunter effort, hunter density, and opinions concerning deer populations and regulations. We also incorporate public comments received throughout the year via the web, letters, calls, social media, public meetings, emails, and any other feedback.

The Deer Program reviews all this information annually on a county-by-county basis to classify the deer population status and trends (**Fig. 16 & 17**). Socially acceptable levels (cultural carrying capacity) are the first thing we look at when classifying the status of the deer population. While biological carrying capacity, or the habitat's limitations on the number of deer that can be supported, is included within our assessment, generally cultural carrying capacity will be met first. We aim for this goal because agricultural producers, motorists, and other stakeholders will often not tolerate deer population levels at biological carrying capacity. By monitoring the population trends for each county we are able to gain an understanding of where the population is headed and adjust harvest regulations accordingly.



Deer populations are fairly stable across most of Missouri and are at, or slightly below, socially acceptable levels (Fig. 16). Exceptions include portions of northern Missouri that are still recovering from a severe outbreak of hemorrhagic disease that occurred in 2012, as well as some counties in southeast Missouri where deer populations have historically been very low, but have been slowly increasing in recent years.

The goal of the MDC is to maintain stable deer populations within each county that are at a socially acceptable level for the majority of interested stakeholders.

County Deer Statistics

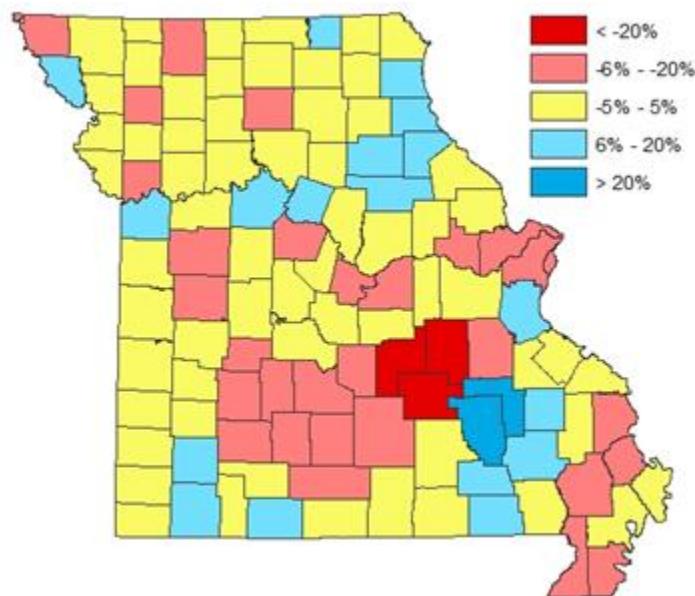


Figure 14. Percent change in the county level deer harvest in Missouri between 2015 and 2016.

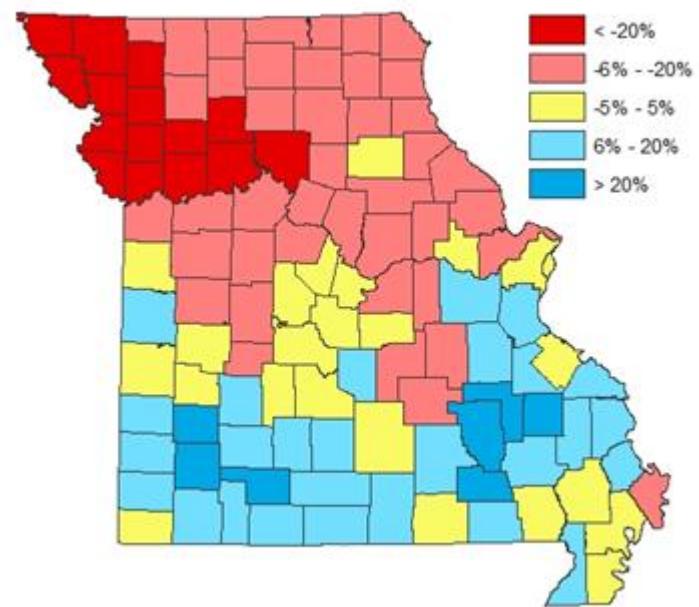


Figure 15. Percent change in the county level deer harvest in Missouri in 2016 compared to the 10-year average.

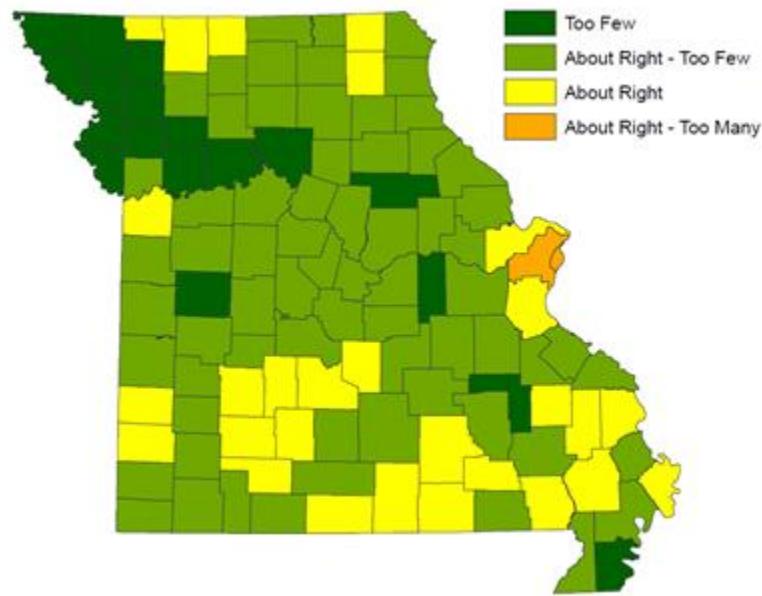


Figure 16. County-specific deer populations, in Missouri, based on socially acceptable levels, 2016.

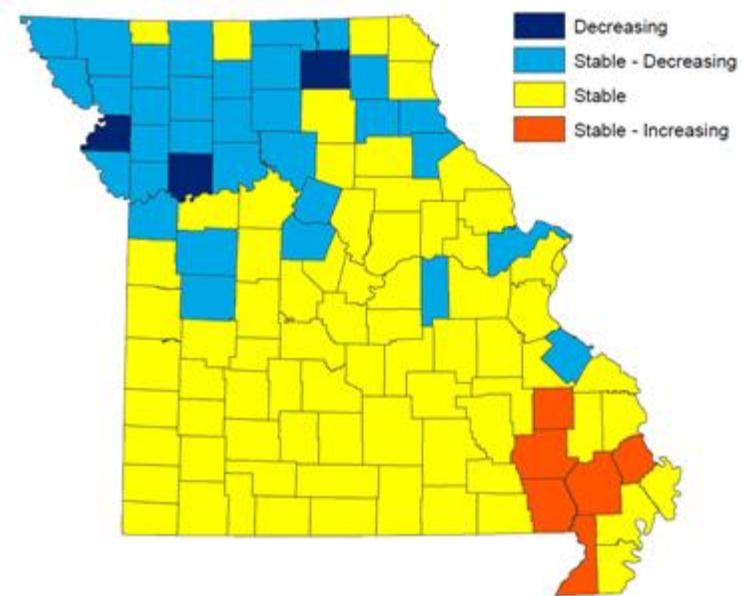


Figure 17. County-specific deer population trends in Missouri, 2016.

Table 6. County Deer Harvest Totals

| County | Archery | | | | Firearms | | | | Totals* | | | |
|----------------|---------------|-------------|-----|-------|---------------|-------------|-------|-------|---------------|-------------|-------|-------|
| | Antlered Buck | Button Buck | Doe | Total | Antlered Buck | Button Buck | Doe | Total | Antlered Buck | Button Buck | Doe | Total |
| Adair | 253 | 56 | 241 | 550 | 1,123 | 228 | 917 | 2,268 | 1,376 | 284 | 1,163 | 2,823 |
| Andrew | 72 | 13 | 70 | 155 | 439 | 63 | 360 | 862 | 511 | 76 | 430 | 1,017 |
| Atchison | 66 | 5 | 50 | 121 | 334 | 40 | 186 | 560 | 400 | 45 | 236 | 681 |
| Audrain | 126 | 34 | 134 | 294 | 682 | 223 | 668 | 1,573 | 808 | 258 | 802 | 1,868 |
| Barry | 190 | 27 | 189 | 406 | 1,014 | 161 | 679 | 1,854 | 1,204 | 188 | 868 | 2,260 |
| Barton | 134 | 37 | 159 | 330 | 684 | 146 | 631 | 1,461 | 820 | 185 | 793 | 1,798 |
| Bates | 132 | 22 | 120 | 274 | 790 | 175 | 683 | 1,648 | 922 | 197 | 803 | 1,922 |
| Benton | 276 | 71 | 341 | 688 | 1,516 | 407 | 1,496 | 3,419 | 1,792 | 481 | 1,842 | 4,115 |
| Bollinger | 279 | 103 | 401 | 783 | 1,465 | 326 | 1,111 | 2,902 | 1,744 | 429 | 1,512 | 3,685 |
| Boone | 278 | 52 | 256 | 586 | 1,201 | 220 | 884 | 2,305 | 1,480 | 272 | 1,142 | 2,894 |
| Buchanan | 49 | 5 | 41 | 95 | 274 | 49 | 256 | 579 | 323 | 54 | 297 | 674 |
| Butler | 220 | 49 | 204 | 473 | 784 | 172 | 501 | 1,457 | 1,005 | 221 | 705 | 1,931 |
| Caldwell | 84 | 4 | 60 | 148 | 504 | 95 | 411 | 1,010 | 588 | 99 | 471 | 1,158 |
| Callaway | 325 | 76 | 326 | 727 | 1,752 | 412 | 1,457 | 3,621 | 2,095 | 493 | 1,809 | 4,397 |
| Camden | 302 | 86 | 403 | 791 | 1,231 | 348 | 1,316 | 2,895 | 1,534 | 434 | 1,719 | 3,687 |
| Cape Girardeau | 153 | 51 | 290 | 494 | 996 | 250 | 923 | 2,169 | 1,149 | 301 | 1,213 | 2,663 |
| Carrol | 111 | 10 | 106 | 227 | 991 | 111 | 532 | 1,634 | 1,102 | 121 | 638 | 1,861 |
| Carter | 240 | 93 | 304 | 637 | 969 | 184 | 605 | 1,758 | 1,229 | 301 | 968 | 2,498 |
| Cass | 182 | 38 | 162 | 382 | 851 | 148 | 662 | 1,661 | 1,033 | 186 | 825 | 2,044 |
| Cedar | 162 | 47 | 175 | 384 | 866 | 243 | 788 | 1,897 | 1,043 | 296 | 994 | 2,333 |
| Chariton | 117 | 8 | 64 | 189 | 869 | 149 | 559 | 1,577 | 990 | 157 | 626 | 1,773 |
| Christian | 198 | 48 | 205 | 451 | 924 | 170 | 640 | 1,734 | 1,122 | 218 | 845 | 2,185 |
| Clark | 247 | 39 | 212 | 498 | 852 | 188 | 836 | 1,876 | 1,099 | 227 | 1,049 | 2,375 |
| Clay | 130 | 20 | 123 | 273 | 294 | 36 | 219 | 549 | 438 | 68 | 357 | 863 |
| Clinton | 50 | 4 | 50 | 104 | 321 | 37 | 244 | 602 | 375 | 43 | 301 | 719 |
| Cole | 118 | 17 | 86 | 221 | 645 | 154 | 547 | 1,346 | 763 | 171 | 640 | 1,574 |
| Cooper | 154 | 33 | 142 | 329 | 951 | 155 | 733 | 1,839 | 1,105 | 188 | 876 | 2,169 |
| Crawford | 198 | 36 | 210 | 444 | 1,275 | 304 | 1,076 | 2,655 | 1,473 | 340 | 1,286 | 3,099 |
| Dade | 111 | 18 | 125 | 254 | 743 | 134 | 483 | 1,360 | 854 | 152 | 609 | 1,615 |
| Dallas | 216 | 59 | 233 | 508 | 1,142 | 268 | 1,026 | 2,436 | 1,358 | 327 | 1,260 | 2,945 |
| Daviess | 159 | 20 | 158 | 337 | 868 | 187 | 723 | 1,778 | 1,027 | 207 | 881 | 2,115 |
| DeKalb | 60 | 5 | 39 | 104 | 388 | 61 | 261 | 710 | 448 | 66 | 300 | 814 |
| Dent | 159 | 50 | 166 | 375 | 1,188 | 305 | 1,120 | 2,613 | 1,349 | 362 | 1,303 | 3,014 |

*Includes Managed Hunt Numbers

Table 6. County Deer Harvest Totals

| County | Archery | | | | Firearms | | | | Totals* | | | |
|------------|---------------|-------------|-----|-------|---------------|-------------|-------|-------|---------------|-------------|-------|-------|
| | Antlered Buck | Button Buck | Doe | Total | Antlered Buck | Button Buck | Doe | Total | Antlered Buck | Button Buck | Doe | Total |
| Douglas | 181 | 41 | 198 | 420 | 1,391 | 272 | 985 | 2,648 | 1,572 | 313 | 1,184 | 3,069 |
| Dunklin | 30 | 12 | 40 | 82 | 185 | 26 | 131 | 342 | 215 | 38 | 171 | 424 |
| Franklin | 406 | 91 | 384 | 881 | 2,159 | 473 | 1,753 | 4,385 | 2,566 | 565 | 2,138 | 5,269 |
| Gasconade | 245 | 39 | 185 | 469 | 1,471 | 293 | 987 | 2,751 | 1,716 | 332 | 1,172 | 3,220 |
| Gentry | 100 | 11 | 75 | 186 | 564 | 94 | 448 | 1,106 | 664 | 105 | 523 | 1,292 |
| Green | 318 | 65 | 330 | 713 | 919 | 180 | 752 | 1,851 | 1,241 | 248 | 1,104 | 2,593 |
| Grundy | 125 | 20 | 117 | 262 | 658 | 113 | 504 | 1,275 | 783 | 133 | 621 | 1,537 |
| Harrison | 242 | 33 | 219 | 494 | 1,247 | 180 | 822 | 2,249 | 1,489 | 213 | 1,040 | 2,742 |
| Henry | 163 | 50 | 196 | 409 | 946 | 287 | 971 | 2,204 | 1,109 | 337 | 1,168 | 2,614 |
| Hickory | 168 | 49 | 156 | 373 | 894 | 264 | 863 | 2,021 | 1,063 | 317 | 1,024 | 2,404 |
| Holt | 75 | 8 | 72 | 155 | 401 | 70 | 283 | 754 | 479 | 78 | 356 | 913 |
| Howard | 163 | 30 | 129 | 322 | 917 | 154 | 774 | 1,845 | 1,082 | 192 | 912 | 2,186 |
| Howell | 356 | 81 | 368 | 805 | 1,950 | 470 | 2,004 | 4,424 | 2,306 | 551 | 2,372 | 5,229 |
| Iron | 83 | 28 | 73 | 184 | 777 | 174 | 463 | 1,414 | 860 | 202 | 537 | 1,599 |
| Jackson | 284 | 49 | 303 | 636 | 392 | 70 | 266 | 728 | 740 | 164 | 771 | 1,675 |
| Jasper | 240 | 39 | 232 | 511 | 998 | 179 | 654 | 1,831 | 1,238 | 218 | 887 | 2,343 |
| Jefferson | 435 | 123 | 560 | 1,118 | 1,688 | 333 | 1,356 | 3,377 | 2,124 | 457 | 1,916 | 4,497 |
| Johnson | 123 | 37 | 149 | 309 | 882 | 199 | 747 | 1,828 | 1,005 | 236 | 898 | 2,139 |
| Knox | 235 | 37 | 185 | 457 | 979 | 180 | 862 | 2,021 | 1,214 | 217 | 1,047 | 2,478 |
| Laclede | 252 | 67 | 287 | 606 | 1,496 | 337 | 1,194 | 3,027 | 1,748 | 404 | 1,481 | 3,633 |
| Lafayette | 51 | 23 | 78 | 152 | 477 | 85 | 427 | 989 | 528 | 108 | 505 | 1,141 |
| Lawrence | 159 | 28 | 151 | 338 | 834 | 140 | 554 | 1,528 | 993 | 168 | 705 | 1,866 |
| Lewis | 157 | 28 | 163 | 348 | 799 | 217 | 740 | 1,756 | 956 | 245 | 903 | 2,104 |
| Lincoln | 220 | 68 | 282 | 570 | 1,154 | 257 | 1,154 | 2,565 | 1,374 | 325 | 1,437 | 3,136 |
| Linn | 217 | 37 | 195 | 449 | 1,158 | 184 | 742 | 2,084 | 1,376 | 221 | 938 | 2,535 |
| Livingston | 141 | 13 | 96 | 250 | 742 | 99 | 487 | 1,328 | 883 | 112 | 584 | 1,579 |
| Macon | 315 | 59 | 266 | 640 | 1,637 | 347 | 1,370 | 3,354 | 1,952 | 406 | 1,636 | 3,994 |
| Madison | 148 | 51 | 228 | 427 | 936 | 235 | 686 | 1,857 | 1,084 | 286 | 914 | 2,284 |
| Maries | 169 | 52 | 189 | 410 | 790 | 214 | 785 | 1,789 | 959 | 266 | 974 | 2,199 |
| Marion | 146 | 39 | 157 | 342 | 684 | 196 | 647 | 1,527 | 830 | 235 | 804 | 1,869 |
| McDonald | 163 | 17 | 122 | 302 | 815 | 108 | 464 | 1,387 | 978 | 125 | 587 | 1,690 |

*Includes Managed Hunt Numbers

Table 6. County Deer Harvest Totals

| County | Archery | | | | Firearms | | | | Totals* | | | |
|----------------|---------------|-------------|-----|--------|---------------|-------------|-------|-------|---------------|-------------|-------|-------|
| | Antlered Buck | Button Buck | Doe | Totals | Antlered Buck | Button Buck | Doe | Total | Antlered Buck | Button Buck | Doe | Total |
| Mercer | 264 | 36 | 219 | 519 | 947 | 129 | 571 | 1,647 | 1,211 | 165 | 790 | 2,166 |
| Miller | 173 | 41 | 175 | 389 | 1,146 | 325 | 999 | 2,470 | 1,320 | 366 | 1,174 | 2,860 |
| Mississippi | 19 | 5 | 23 | 47 | 156 | 17 | 55 | 228 | 175 | 22 | 78 | 275 |
| Moniteau | 77 | 17 | 71 | 165 | 677 | 192 | 497 | 1,366 | 754 | 209 | 568 | 1,531 |
| Monroe | 203 | 64 | 203 | 470 | 1,031 | 293 | 1,087 | 2,411 | 1,234 | 374 | 1,352 | 2,960 |
| Montgomery | 161 | 59 | 193 | 413 | 970 | 300 | 968 | 2,238 | 1,131 | 360 | 1,161 | 2,652 |
| Morgan | 256 | 69 | 275 | 600 | 1,475 | 360 | 1,320 | 3,155 | 1,731 | 429 | 1,595 | 3,755 |
| New Madrid | 23 | 9 | 34 | 66 | 158 | 26 | 96 | 280 | 181 | 35 | 131 | 347 |
| Newton | 249 | 27 | 199 | 475 | 923 | 159 | 680 | 1,762 | 1,178 | 187 | 884 | 2,249 |
| Nodaway | 153 | 9 | 107 | 269 | 754 | 90 | 512 | 1,356 | 907 | 99 | 619 | 1,625 |
| Oregon | 285 | 71 | 338 | 694 | 1,583 | 433 | 1,763 | 3,779 | 1,869 | 504 | 2,102 | 4,475 |
| Osage | 273 | 62 | 271 | 606 | 1,494 | 367 | 1,259 | 3,120 | 1,769 | 429 | 1,531 | 3,729 |
| Ozark | 209 | 56 | 213 | 478 | 1,461 | 235 | 942 | 2,638 | 1,701 | 293 | 1,172 | 3,166 |
| Pemiscot | 12 | 0 | 17 | 29 | 60 | 14 | 49 | 123 | 72 | 14 | 66 | 152 |
| Perry | 129 | 29 | 210 | 368 | 1,084 | 273 | 1,127 | 2,484 | 1,213 | 303 | 1,337 | 2,853 |
| Pettis | 124 | 26 | 153 | 303 | 753 | 207 | 750 | 1,710 | 877 | 233 | 903 | 2,013 |
| Phelps | 154 | 49 | 209 | 412 | 798 | 244 | 869 | 1,911 | 952 | 293 | 1,079 | 2,324 |
| Pike | 282 | 58 | 308 | 648 | 1,348 | 392 | 1,381 | 3,121 | 1,630 | 452 | 1,697 | 3,779 |
| Platte | 148 | 20 | 180 | 348 | 345 | 39 | 250 | 634 | 493 | 59 | 430 | 982 |
| Polk | 208 | 52 | 227 | 487 | 1,151 | 182 | 841 | 2,174 | 1,359 | 234 | 1,069 | 2,662 |
| Pulaski | 224 | 67 | 249 | 540 | 777 | 234 | 758 | 1,769 | 1,001 | 301 | 1,007 | 2,309 |
| Putnam | 305 | 20 | 268 | 593 | 1,032 | 128 | 687 | 1,847 | 1,337 | 148 | 955 | 2,440 |
| Ralls | 157 | 29 | 172 | 358 | 799 | 224 | 696 | 1,719 | 956 | 253 | 869 | 2,078 |
| Randolph | 171 | 31 | 148 | 350 | 949 | 152 | 692 | 1,793 | 1,120 | 184 | 840 | 2,144 |
| Ray | 76 | 13 | 69 | 158 | 614 | 110 | 463 | 1,187 | 691 | 124 | 532 | 1,347 |
| Reynolds | 170 | 46 | 184 | 400 | 1,155 | 224 | 760 | 2,139 | 1,325 | 270 | 945 | 2,540 |
| Ripley | 270 | 95 | 340 | 705 | 1,272 | 373 | 1,306 | 2,951 | 1,542 | 468 | 1,646 | 3,656 |
| St. Charles | 196 | 33 | 213 | 442 | 632 | 132 | 461 | 1,225 | 917 | 199 | 782 | 1,898 |
| St. Clair | 159 | 67 | 257 | 483 | 1,261 | 380 | 1,316 | 2,957 | 1,420 | 450 | 1,574 | 3,444 |
| St. Francois | 160 | 72 | 208 | 440 | 888 | 208 | 739 | 1,835 | 1,048 | 281 | 947 | 2,276 |
| St. Louis | 346 | 106 | 527 | 979 | 342 | 61 | 262 | 665 | 729 | 187 | 865 | 1,781 |
| Ste. Genevieve | 127 | 35 | 186 | 348 | 1,129 | 213 | 898 | 2,240 | 1,256 | 248 | 1,084 | 2,588 |

*Includes Managed Hunt Numbers

Table 6. County Deer Harvest Totals

| County | Archery | | | | Firearms | | | | Totals* | | | |
|-------------|---------------|-------------|--------|--------|---------------|-------------|--------|---------|---------------|-------------|---------|---------|
| | Antlered Buck | Button Buck | Doe | Total | Antlered Buck | Button Buck | Doe | Total | Antlered Buck | Button Buck | Doe | Total |
| Saline | 102 | 22 | 124 | 248 | 759 | 138 | 651 | 1,548 | 861 | 160 | 775 | 1,796 |
| Schuyler | 142 | 20 | 113 | 275 | 655 | 158 | 556 | 1,369 | 797 | 178 | 669 | 1,644 |
| Scotland | 245 | 40 | 227 | 512 | 997 | 240 | 859 | 2,096 | 1,242 | 280 | 1,086 | 2,608 |
| Scott | 57 | 6 | 55 | 118 | 278 | 60 | 213 | 551 | 335 | 66 | 270 | 671 |
| Shannon | 172 | 37 | 181 | 390 | 1,204 | 293 | 1,069 | 2,566 | 1,380 | 332 | 1,257 | 2,969 |
| Shelby | 192 | 34 | 187 | 413 | 954 | 197 | 782 | 1,933 | 1,146 | 231 | 969 | 2,346 |
| Stoddard | 145 | 81 | 292 | 518 | 664 | 154 | 497 | 1,315 | 827 | 240 | 810 | 1,877 |
| Stone | 153 | 24 | 175 | 352 | 694 | 121 | 487 | 1,302 | 847 | 145 | 663 | 1,655 |
| Sullivan | 245 | 21 | 176 | 442 | 1,167 | 158 | 825 | 2,150 | 1,413 | 179 | 1,001 | 2,593 |
| Taney | 216 | 51 | 199 | 466 | 1,154 | 136 | 710 | 2,000 | 1,370 | 187 | 909 | 2,466 |
| Texas | 306 | 47 | 293 | 646 | 1,968 | 389 | 1,601 | 3,958 | 2,276 | 436 | 1,895 | 4,607 |
| Vernon | 175 | 46 | 226 | 447 | 1,017 | 245 | 912 | 2,174 | 1,200 | 295 | 1,164 | 2,659 |
| Warren | 208 | 44 | 171 | 423 | 947 | 226 | 640 | 1,813 | 1,155 | 270 | 811 | 2,236 |
| Washington | 137 | 47 | 169 | 353 | 1,014 | 263 | 843 | 2,120 | 1,151 | 310 | 1,012 | 2,473 |
| Wayne | 315 | 148 | 517 | 980 | 1,819 | 511 | 1,252 | 3,582 | 2,155 | 662 | 1,779 | 4,596 |
| Webster | 238 | 48 | 220 | 506 | 1,142 | 197 | 829 | 2,168 | 1,380 | 245 | 1,049 | 2,674 |
| Worth | 108 | 8 | 100 | 216 | 419 | 51 | 268 | 738 | 527 | 59 | 368 | 954 |
| Wright | 191 | 36 | 185 | 412 | 1,081 | 213 | 736 | 2,030 | 1,272 | 249 | 912 | 2,442 |
| Regions | | | | | | | | | | | | |
| Central | 2,922 | 689 | 2,959 | 6,570 | 16,161 | 3,855 | 13,845 | 33,861 | 19,108 | 4,559 | 16,850 | 40,517 |
| Kansas City | 1,947 | 469 | 2,288 | 4,704 | 9,524 | 2,278 | 8,699 | 20,501 | 11,557 | 2,814 | 11,240 | 25,611 |
| Northeast | 3,295 | 575 | 3,026 | 6,896 | 15,006 | 3,298 | 12,937 | 31,241 | 18,302 | 3,893 | 16,040 | 38,235 |
| Northwest | 2,269 | 262 | 1,907 | 4,438 | 12,492 | 1,912 | 8,632 | 23,036 | 14,774 | 2,177 | 10,551 | 27,502 |
| Ozark | 2,747 | 723 | 3,044 | 6,514 | 15,642 | 3,645 | 13,758 | 33,045 | 18,449 | 4,403 | 16,906 | 39,758 |
| Southeast | 2,070 | 725 | 2,962 | 5,757 | 12,534 | 2,883 | 9,501 | 24,918 | 14,644 | 3,618 | 12,499 | 30,761 |
| Southwest | 3,375 | 703 | 3,384 | 7,462 | 16,393 | 3,125 | 12,275 | 31,793 | 19,796 | 3,844 | 15,731 | 39,371 |
| St. Louis | 2,146 | 548 | 2,516 | 5,210 | 9,211 | 2,049 | 7,545 | 18,805 | 11,489 | 2,653 | 10,247 | 24,389 |
| Grand Total | | | | | | | | | | | | |
| Statewide | 20,771 | 4,694 | 22,086 | 47,551 | 106,963 | 23,045 | 87,129 | 217,200 | 128,119 | 27,961 | 110,064 | 266,144 |

*Includes Managed Hunt Numbers

Adjusting Management to Changing Deer & Hunter Populations

Advancements in Knowledge and Recent Challenges

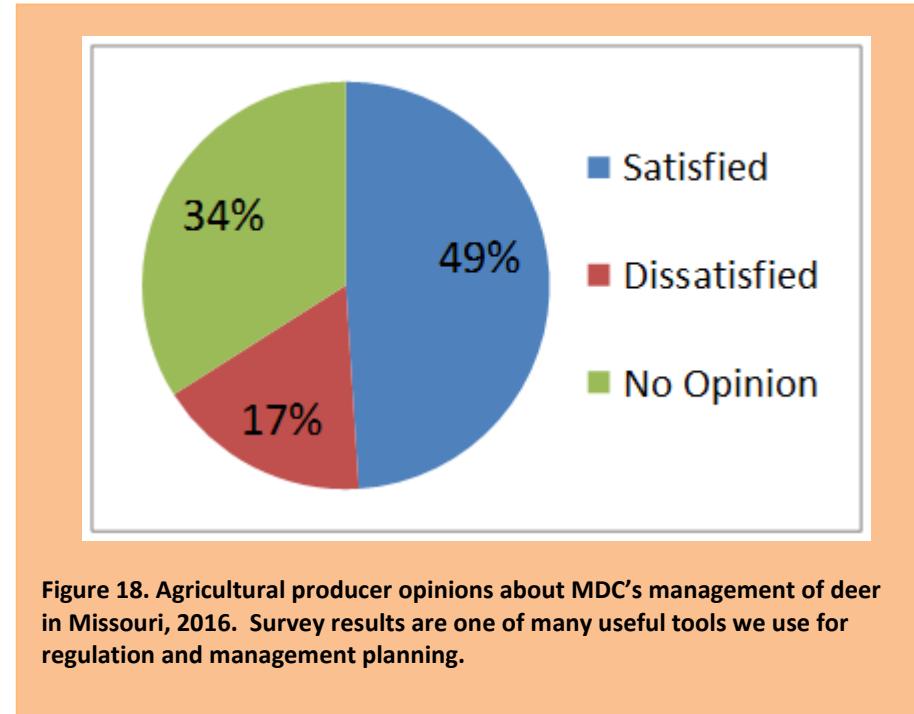
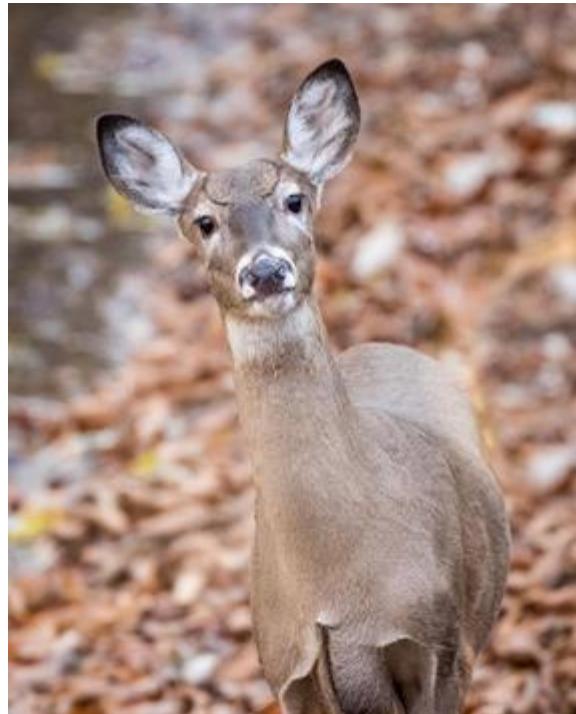
As technology advances, we are certainly able to learn more about wildlife than ever before. With greater insight, the MDC has the opportunity to address some more complicated management objectives with respect to Missouri's natural resources, including white-tailed deer. Prior to the 1980's, deer management efforts in Missouri were focused on re-establishing and growing healthy populations statewide. By the late 1980's, this goal had been achieved within the Northern and Central Regions of Missouri, resulting in management techniques shifting toward the liberalization of hunting quotas in order to prevent overabundance. From there, deer management has become more involved as we work to fine-tune socially acceptable deer populations throughout the state.

To address this overarching objective, deer management in Missouri is focused on establishing and achieving population goals on a more localized level. Regulations and management decisions are considered on a county-by-county basis, which requires an intimate understanding of localized deer populations, as well as stakeholder concerns and opinions.

In order to be successful, we have taken steps to better understand the movement and home ranges of deer across the landscape, patterns of deer mortality and reproduction (see page 24), and changes in hunter participation (see page 21). We are also addressing new challenges by gathering age-at-harvest data through Telecheck measurements and tooth samples. By having a better idea of the age at which deer are harvested, we can apply this information to accurately model population growth at the county level (see page 20).

In order to address changes in Missouri's hunter population and participation rates, MDC periodically employs new regulations as well as outreach and education tactics that facilitate hunter recruitment and retention. The legalization of crossbows during archery season and hunting clinics designed for beginning hunters are examples of a recent changes made by the Department in response to changes in hunter participation.

Managing wildlife populations for the enjoyment of Missourians may not always be easy, but the Missouri Department of Conservation is up to the task. The MDC will continue to embrace new challenges by employing advances in technology in order to gain further insight and will work with Missourians to ensure our deer and elk populations remain balanced and healthy.

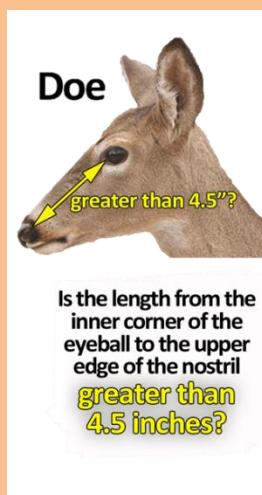
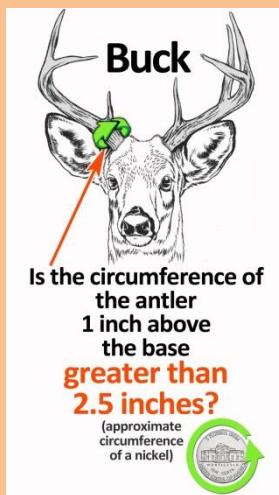


Changes to Telecheck and the MO Hunting App

Beginning in 2016, hunters were asked new questions when they checked a deer. In order to assess the effect of crossbows on archery deer harvest, all successful archery hunters were asked if they used a crossbow to harvest their deer. In addition, hunters were asked the following:

- If checking a doe: **Is the distance from the edge of the eyeball to the edge of the nostril greater than 4.5 inches?**
- If checking an antlered buck: **Is the circumference of the antler 1 inch above the base greater than 2.5 inches?**

No additional Telecheck questions will be added for the 2017 season.

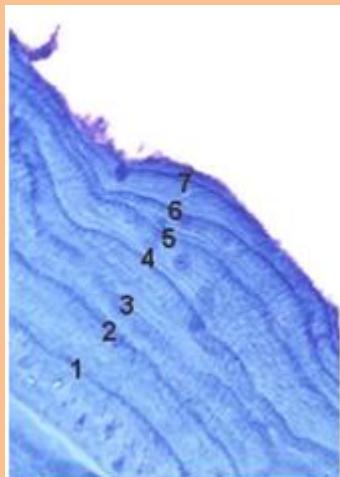


The purpose of these measurements is to determine the age class of the deer that was harvested. The question about does will help us differentiate between female fawns (0.5 years old) and older females, and the question about bucks will help us differentiate between yearling (1.5 years old) males and older bucks.

This information is essential to our population models and helps us better manage the deer population. You can be prepared by having a ruler or other measurement tool handy in the field.

Age at Harvest Sampling

In addition to the Telecheck measurement questions, we are also working with universities and meat processors throughout the state to collect teeth from harvested, adult deer. These tooth samples are then sent to a lab to have the layers of cementum annuli analyzed. Much like growth rings in a tree, these layers develop on the tooth root over time, enabling us to more precisely age adult deer.



The layers cementum deposited on the root of teeth.



The front two incisors are collected for aging.



An image of an extracted incisor from an adult deer.

All About Crossbows

Deer hunting is the primary tool that we use to manage deer populations. Thus, the recruitment of new and/or youth hunters and retention of older hunters as they age is of paramount importance to the Cervid Program. About a third of our hunters are from the “baby boomer” generation, and as that generation ages we expect that some hunters will drop out of the sport. Some states have witnessed steady declines in hunter participation over the past 10 years as hunters age and are not replaced by recruitment of youth or novice hunters. Here in Missouri, our hunter numbers have remained relatively stable, thanks in part to youth hunting opportunities and recruitment efforts. However, we continually explore opportunities to improve hunter recruitment and retention. That is why, beginning in 2016 crossbows became a legal weapon for use during archery season. Prior to this regulation change, hunters were required to obtain a medical exemption based on a physician’s reference in order to use crossbows during the archery season. As the number of exemptions issued each year steadily increased, this change was a logical step to increase opportunity for archery hunters.

So what changes did we see in the first year of crossbows as a legal archery weapon? The answer, as far as the archery deer harvest was concerned, was not much. The total number of deer harvested during the 2016 archery season was 4% lower than in 2015 and 2% lower than the 10-year average. We observed no difference in the sex or age class of deer taken by vertical bow and crossbow hunters. The success rate of archery hunters was slightly less than last year at 18.7%.

However, we did see a change in archery season participation during 2016, most likely as a result of the allowance of crossbows. The total number of individuals that purchased an archery permit increased 8% from 2015 and was 9% higher than the 5-year-average. Those increases were especially pronounced among the younger and older hunter age classes. Although the number of archery hunters increased during 2016, the total number of deer hunters decreased by 1%, which was driven by a decrease in firearms hunters.

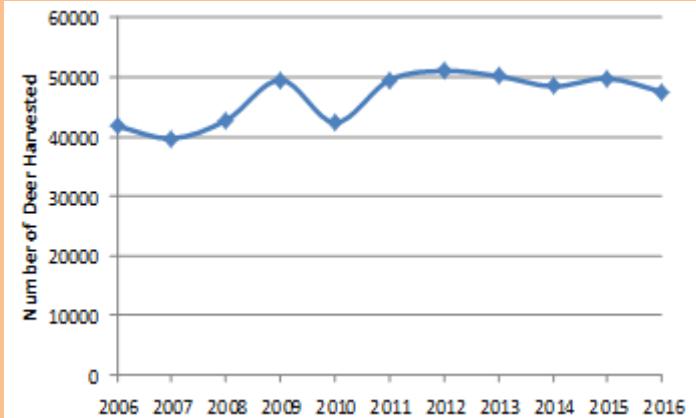


Figure 19. Total number of deer harvested in Missouri per archery season, 2006-2016.

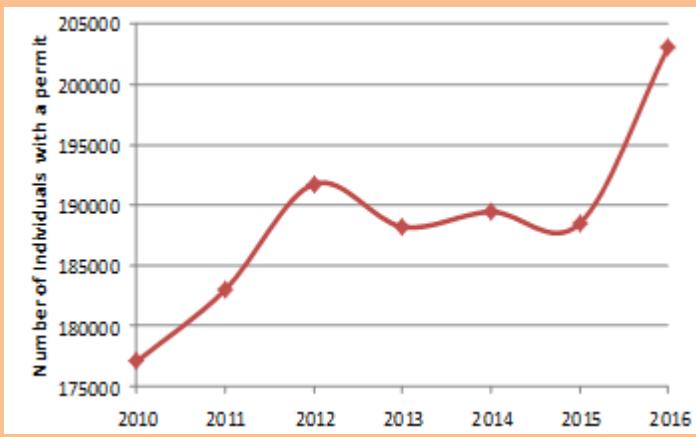


Figure 20. Total number of archery permits sold in Missouri per archery season, 2010-2016.

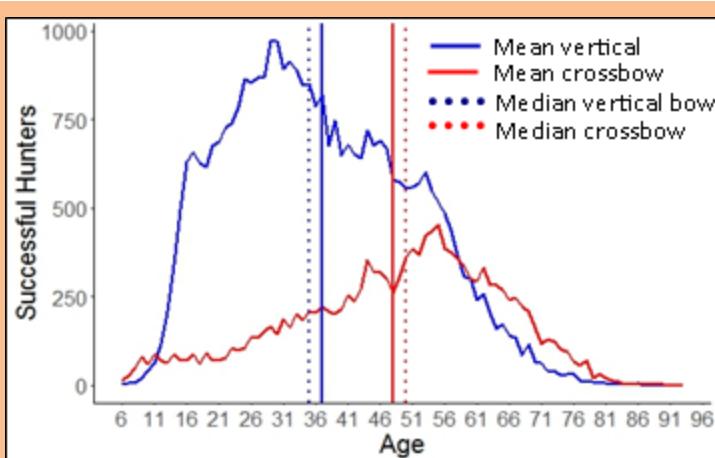


Figure 21. The number of successful crossbow and vertical bow hunters by age in Missouri, 2016.

We are able to monitor the characteristics of successful vertical bow and crossbow hunters via the Telecheck process. Successful archery hunters are prompted to answer if they used a crossbow to harvest their deer when checking it in. We found that the mean age of successful crossbow hunters was about 10 years older than successful vertical bow hunters, and that hunters were more likely to have used crossbows to harvest their deer if they were younger than 10 years or older than 60 years of age. Overall, 70% of successful hunters used a vertical bow and 30% used a crossbow. We intend to continue to monitor these trends in the future.

Deer Management on Private Lands



MDC offers a variety of assistance to landowners looking to improve their land for wildlife.

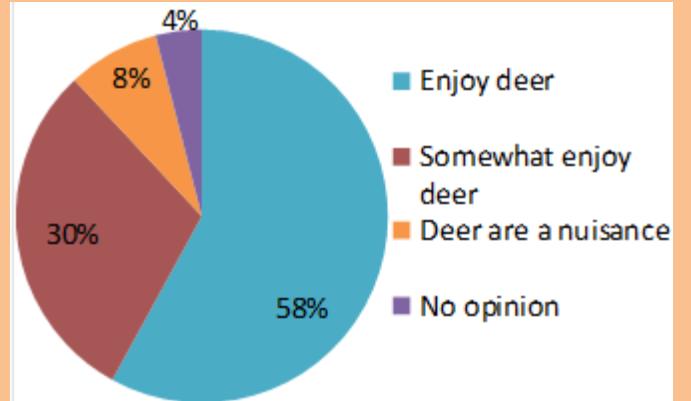
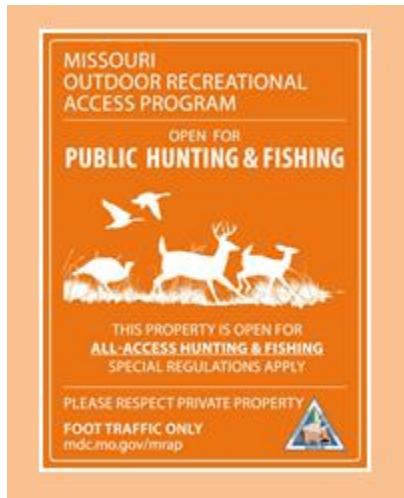


Figure 22. Pie chart showing Missouri landowner opinions about deer on their property in 2016.

Managing Your Land for Deer

With more than 93% of Missouri land under private ownership, we greatly depend on landowners implementing habitat management practices to increase the quality and quantity of wildlife cover and forage. These practices not only benefit deer, but profit other species such as turkeys and upland game as well. Missouri Department of Conservation staff, including Private Land Conservationists, work with landowners to develop management plans according to the landowners' goals. Department staff can guide and teach management techniques such as timber stand improvement, food plot development, and invasive species control. Some of these programs offer cost-share incentives as well as property tax reductions and grants.



Missouri Outdoor Recreational Access Program

The Missouri Outdoor Recreational Access Program (MRAP) is a voluntary program that offers private landowners annual incentive payments as well as habitat improvement assistance for opening their land to public access for outdoor recreational activities such as hunting, fishing, and wildlife viewing. The Missouri Department of Conservation received a 3-year grant for \$1.1 million from the U.S. Department of Agriculture as part of the 2014 Farm Bill, through the Voluntary Public Access – Habitat Incentive Program (VPA-HIP). Approximately 6,000 acres of private land are currently enrolled in MRAP.

To view a map of enrolled MRAP properties and for more information about the program, visit the 'Your Property' section at mdc.mo.gov or contact your local Private Land Conservationist.

Deer Cooperatives

By monitoring deer movements through ongoing research, we witness the ability of deer to utilize large areas of land. This reinforces the importance of landowners working together to improve wildlife habitat. A recent survey showed that only about 13% of landowners work with their neighbors when it comes to land management. Deer can have home ranges over 1,000 acres so it is vital that landowners work together to create travel corridors with plenty of cover for them to travel along. Luckily, cooperatives, or co-ops, are growing in popularity across Missouri as landowners and families gather at workshops to learn about wildlife and habitat management and implement what they have learned in the field.

For more information regarding deer cooperatives or land management, visit mdc.mo.gov or contact the Private Lands Deer Biologist at 573-815-7901 ext. 2899

Cervid Program Research Projects

Survival, Recruitment, and Movement Patterns of White-tailed Deer in Missouri

The Missouri Department of Conservation has partnered with the University of Missouri and the University of Montana to evaluate deer reproduction, movement and survival patterns in 2 contrasting Missouri habitats: the glaciated planes of the Northwest and the forested hills of the central Ozarks. The data collected during this 5-year study will influence deer management efforts in the years to come.

Efforts within the two study areas began in January 2015 to trap, affix GPS collars, and monitor male and female deer of all ages. Monitored deer lost each year due to natural death, hunter harvest, or maturation are replenished annually following the hunting season. From December to April, adult deer are captured using specially designed traps and nets, and collared. At this time, transmitters are given to pregnant females that alert researchers when they give birth. This allows the MU crew and MDC staff to locate, capture, and collar fawns during the summer months.

A majority of the data from this project is being collected on private land. Without the help of generous landowners, crews could not gain access to enough varying habitat to locate and trap deer.

For questions or interest in participating, contact the Private Lands Deer Biologist at (573) 815-7901 ext. 2899.



| 2017 Deer Capture Results | | | |
|---------------------------|-------|------|-------|
| | Bucks | Does | Total |
| Northwest | 47 | 23 | 70 |
| Ozark | 43 | 26 | 69 |
| Currently Collared* | 103 | 101 | 204 |

Table 7. This was the most successful season yet! More than 139 deer were captured and collared this season, bringing the total number of collared deer to 204!

*As of April 1, 2017 including some previously collared deer



The Ozark crew retrieves a young deer from a clover trap.



Figure 23. Stars on the map indicate the general location of trapping efforts in Southeast Missouri, 2016.

Southeast Deer Movement Study

A new, 3-year study kicked-off in the summer of 2016 to gain a better understanding of deer movement ecology related to small soybean fields in Southeast Missouri. Browsing by deer can cause damage to soybean fields, especially small fields surrounded by forested terrain. To help us understand deer movement in these landscapes, MDC has begun capturing and fitting deer with GPS collars during the summer months. The GPS collars will help us understand how deer utilize the landscape throughout the year and help to inform landowners and hunters about deer movements and target efforts to reduce deer densities where deer are causing crop damage.

In the summer of 2016, MDC collared 18 adult does and intends to capture and collar an additional 33 deer this upcoming summer. An early look at the movement data shows deer staying relatively close to their capture locations.

For questions or more information, contact the Cervid Biologist at (573) 815-7901 ext. 2892.

Restoring Elk in Missouri



Photo to the left:

Researchers handling an immobilized bull elk at Peck Ranch CA. The elk is blindfolded to reduce stress and the crew monitors vitals much like a doctor would during surgery.

Figure 24. (right)
Elk Restoration Zone in Southeast Missouri, 2016.



Elk, a native species in Missouri, disappeared from the state during the mid-1800s primarily due to unregulated hunting. Elk were reintroduced into Missouri between 2011 and 2013. Free-ranging elk from Kentucky were captured, underwent rigorous health testing, and were then transported to South-central Missouri (Carter, Reynolds, and Shannon counties) for release. This area was chosen for elk restoration due to the high amount of public land, low road density, and low row-crop acreage. Since the reintroduction of elk back into Missouri, the elk population has been on the rise and doing well! We have a target population goal of around 400-500 individuals and plan to manage the herd through regulated hunting in the coming years as the population grows.

The elk spend the majority of their time within the Elk Restoration Zone (see above right), usually on a combination of MDC, National Park Service, and Nature Conservancy lands. Support for the elk remains high and the public enjoys the presence of this native herbivore on the landscape.

Researchers with MDC, the University of Missouri, and the University of Montana have been busy monitoring the elk. Crews have captured elk throughout the last 2 winters to assess their health and to equip them with GPS collars. Capture of these individuals is part of regular monitoring efforts to help better understand how elk are utilizing their habitat, to monitor survival, and to check for pregnancy among cows.

Any cows we capture that are pregnant are given a vaginal implant transmitter (VIT). Those VITs will allow us to detect when the cows give birth later this spring, find the newborn calves, assess their health, and fit the calves with a collar to monitor their survival. The same efforts last year aided in the capture and collaring of 21 newborn calves.

For more information, visit mdc.mo.gov or contact the Cervid Biologist at (573) 815-7901 ext. 2892.



91% of the 34 adult cows and 50% of the 4 yearling cows we caught were pregnant! Pictured above in the ultrasound image you can see the head of a prenatal calf.

As of April 1, 2017, we have 84 elk collared (27 male, 57 female). The information we collect from these collars will help us develop a model to better track population growth and make sound management decisions. We estimate the total population to be around 139 individuals including 33 adult bulls, 11 yearling bulls, 65 cows, and 30 calves. The population is showing signs of increased calf production. The next couple of years will be exciting for elk in Missouri!

| 2016-17 Elk Capture Results | |
|-----------------------------|-----------|
| Bull Elk | 17 |
| Cow Elk | 40 |
| Total Elk | 57 |

Table 8. This season the research crew captured a total of 57 elk in parts of Carter, Shannon, and Reynolds Counties on MDC and National Park Service lands.

Chronic Wasting Disease

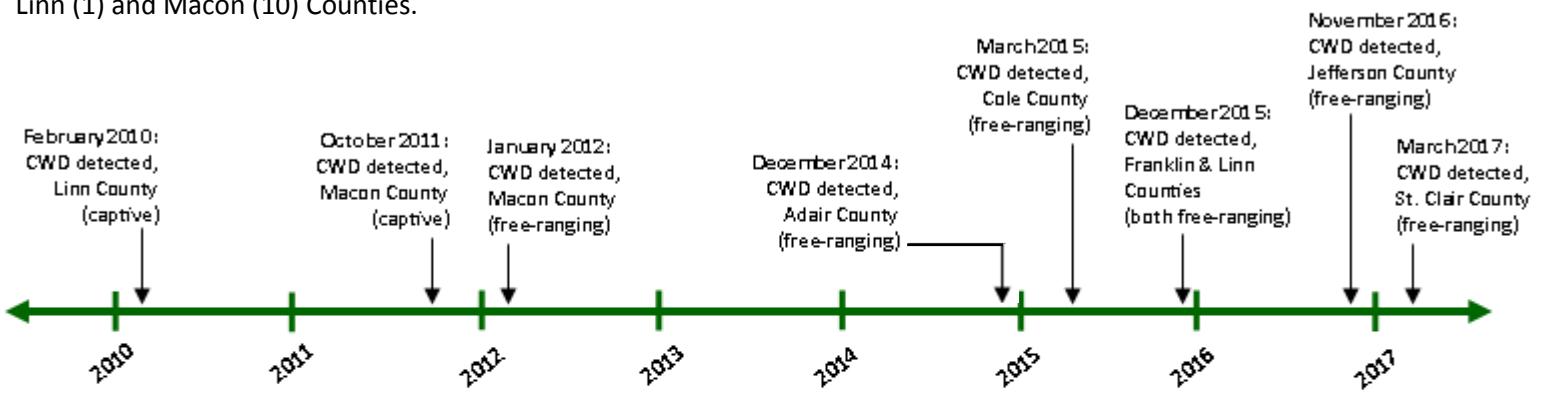
What is Chronic Wasting Disease?

Chronic Wasting Disease (CWD) is a fatal, neurological disease of deer caused by an abnormal protein known as a “prion.” The prion causes deterioration of the brain in cervids such as deer, elk, and moose infected with the disease. Infected cervids can spread the disease directly through contact with others or indirectly from infected soil and other surfaces. Additionally, CWD can spread geographically through the natural movements of infected cervids and movement of infected carcasses or captive cervids. In areas where CWD becomes established, it grows in prevalence and distribution, potentially causing significant population declines.



CWD in Missouri

CWD has been found in seven Missouri counties since 2010. As of June 5, 2017, CWD has been detected in 42 free-ranging deer in Macon (23), Adair (10), Cole (1), Franklin (4), Linn (1), Jefferson (1), and St. Clair (2) Counties, and 11 captive deer in Linn (1) and Macon (10) Counties.



CWD in Arkansas

CWD was detected for the first time in Arkansas in February of 2015. As of May 15, 2017, Arkansas had detected 212 CWD-positive cervids in the state including 6 elk and 206 white-tailed deer. Given the high prevalence and wide geographic distribution of CWD in Arkansas within close proximity to the Missouri border, MDC increased surveillance in Barry, Christian, Douglas, McDonald, Ozark, Stone, and Taney Counties during the 2016 season. MDC staff collected 983 samples from hunter-harvested, sick, and road-killed deer with no positive detections. Intensified surveillance will continue along the Missouri-Arkansas border.

Mandatory Sampling

During opening weekend of the November Portion of the 2016 Firearms Deer Season, hunters within the 29 County CWD Management Zone were required to present their deer to an MDC sampling station for testing. From the 19,200 samples collected, 5 male deer were confirmed CWD-positive and 2 new areas of infection in Jefferson County and southwest Franklin County were identified. Mandatory sampling provides valuable information regarding the distribution and prevalence of CWD on the Missouri landscape. For Fall 2017, the CWD Management Zone will expand from 29 to 41 counties. During the opening weekend of the November portion of the firearms deer season, hunters in 25 of the 41 Management Zone counties will be required to present their deer, or deer head with 6" of attached neck, for CWD testing during the opening weekend of the November Portion of the Firearms Deer Season, Nov. 11 and 12.

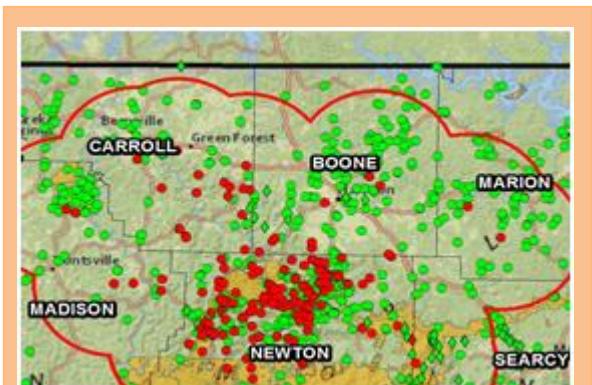
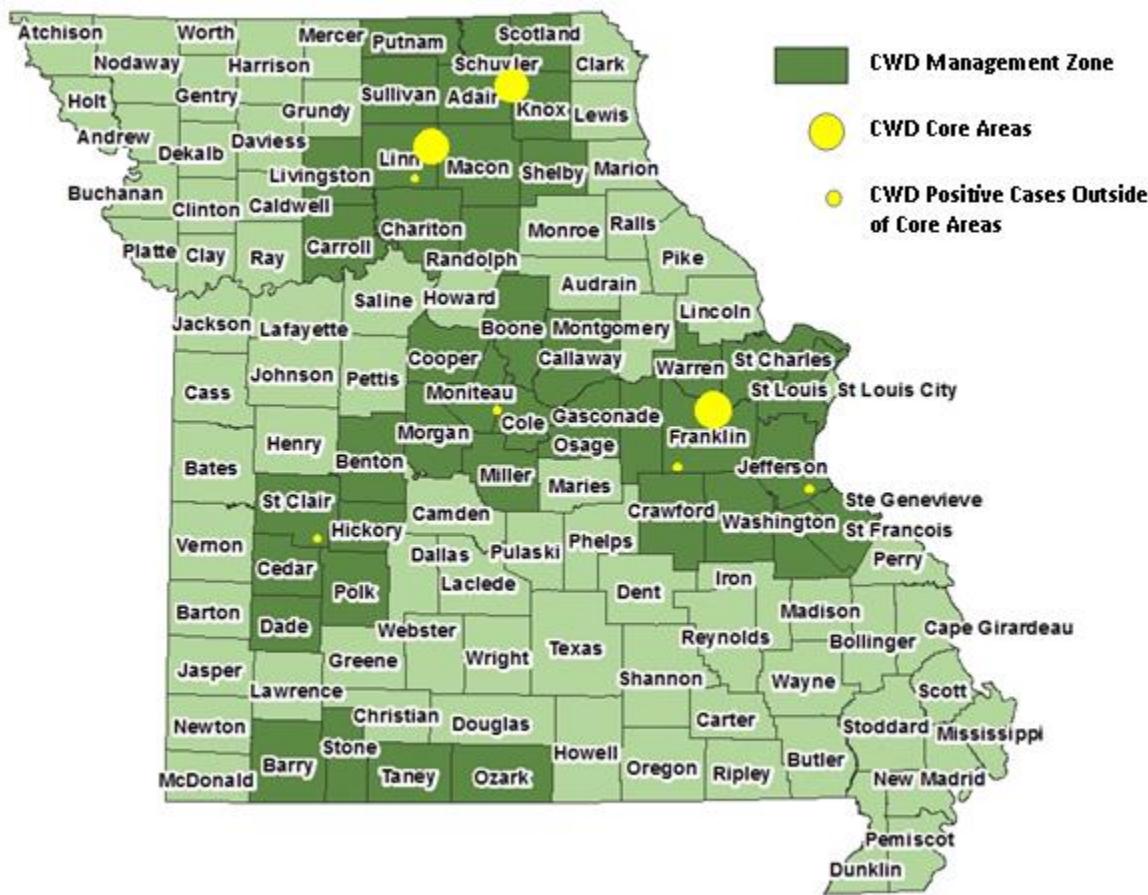


Figure 25. Arkansas' first CWD detection was an elk harvested during the 2015 hunting season. According to the Arkansas Game and Fish Commission, there are currently 11 counties included in their CWD Management Zone, 7 of which have confirmed positive cases of CWD. (Red dots indicate positives)

Managing CWD

MDC has sampled over 77,000 deer throughout the state since 2001. Routine annual surveillance occurs in half of the state each year, with additional surveillance near CWD-positives. MDC establishes a “CWD Management Zone” around locations where CWD has been detected in Missouri. The CWD Management Zone includes all counties within an approximately 25-mile radius around known locations of CWD-positive deer. Within the CWD Management Zone, MDC implements several regulation changes and management strategies to limit the spread and prevalence of the disease.

In collaboration with the University of Missouri, MDC has implemented a research project to model CWD distribution and potential impacts on Missouri’s deer population. This information may provide insight on management adjustments that could limit CWD distribution and prevalence. Additionally, the study will provide the ability to compare management strategies to detect new cases of CWD early in the infection process and efficiently manage resources.



CWD Management Strategies

The following disease-management strategies apply within the CWD Management Zone:

- Allow the harvest of 2 antlerless deer during the firearms season to prevent unwanted population increases and limit the spread of the disease.
- Ban the placement of feed, minerals and other consumable deer attractants because they unnaturally concentrate deer and can increase disease spread.
- Remove the antler-point restriction. Antler-point restrictions protect young bucks which are most likely to disperse to new areas and may spread the disease across the landscape.
- Intensified efforts to sample hunter-harvested deer in the CWD Management Zone.
- Post-season targeted sampling within CWD Core Areas to decrease the spread and prevalence in localized areas where the disease is known to exist.

For more information regarding CWD or disease management, visit mdc.mo.gov or contact the Wildlife Disease Coordinator at 573-815-7901 ext. 2934



Missouri Department of Conservation